Before the **FEDERAL COMMUNICATIONS COMMISSION**

Washington, D.C. 20554

In the Matter of)	
Technology Transitions Policy Task Force Public Notice Regarding Potential Trials)	GN Docket No. 13-5

COMMENTS OF T-MOBILE USA, INC.

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T-Mobile USA, Inc.¹ ("T-Mobile") responds to the Technology Transitions Policy Task Force ("Task Force") Public Notice requesting comments on the conduct of trials relating to the ongoing transition of the public switched telephone network ("PSTN") from time-division multiplexed ("TDM") facilities and services to facilities and offerings based on the Internet Protocol ("IP").²

I. INTRODUCTION AND SUMMARY

T-Mobile supports the Public Notice's proposal for a trial of the exchange of voice traffic in IP format.³ In its comments on the AT&T and National Telecommunications Cooperative Association ("NTCA") IP transition petitions, ⁴ T-Mobile articulated a plan for such a trial, ⁵ and

¹ T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly-traded company.

² Technology Transitions Policy Task Force Seeks Comment on Potential Trials, Public Notice, 28 FCC Rcd 6346 (2013) ("Public Notice"); Comment Cycle Established for Technology Transitions Policy Task Force Public Notice Regarding Potential Trials, Public Notice, 28 FCC Rcd 7555 (2013).

³ Public Notice, 28 FCC Rcd at 6348-51.

⁴ *See* AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition, GN Dkt. No. 12-353 (filed Nov. 7, 2012); Petition of the National Telecommunications Cooperative Association for a Rulemaking to Promote and Sustain the Ongoing TDM-to-IP Evolution, GN Dkt. No. 12-353 (filed Nov. 19, 2012).

seeks to develop its proposal more fully in these comments in the context of the Task Force's questions.⁶

As the Commission's own Technological Advisory Council ("TAC") has observed, "the process, specifications and technology for successful [IP] interconnection is fairly mature." In fact, many carriers, including T-Mobile, have long been interconnecting in IP format, including for the exchange of voice traffic. For T-Mobile this is typically with wireless carriers, cable operators, and competitive local exchange carriers ("CLECs") rather than incumbent local exchange carriers ("ILECs") with whom, in T-Mobile's experience, it has been exceedingly difficult to negotiate IP interconnection agreements. As a result, as the TAC has found, "delays in VoIP interconnection are largely due to policy and commercial issues, not technology issues." To allow the IP transition to move forward, the Commission therefore should move with dispatch to conduct a trial or trials to determine how best to eliminate or resolve these policy and commercial issues. As the Public Notice correctly observes, such trials would provide the Commission with "a factual record to help determine what policies are appropriate to

⁵ See Comments of T-Mobile USA, Inc. at 17-18, GN Docket No. 12-353 (filed Jan. 28, 2013) ("T-Mobile AT&T/NTCA Comments"); Reply Comments of T-Mobile USA, Inc. at 10-11, GN Docket No. 12-353 (filed Feb. 25, 2013) ("T-Mobile AT&T/NTCA Reply Comments").

⁶ Public Notice, 28 FCC Rcd at 6355. At the outset we note that, by contrast, a geographic all-IP trial along the lines proposed by AT&T would serve no purpose. *See* T-Mobile AT&T/NTCA Comments at 4-15 (a deregulated, wire-center based IP trial would preserve legacy inefficiencies of the TDM network, eliminate important protections for competitors and consumers, and prove nothing since large participants would be on their best behavior).

⁷ FCC Technological Advisory Council, *TAC Memo – VoIP Interconnection* at 1 (Sept. 24, 2012), available at http://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting92412/VoIP-Interconnection-TAC-Memo-9-24-12.pdf ("TAC Memo").

⁸ *Id*.

promote investment and innovation while protecting consumers, promoting competition, and ensuring that emerging all-[IP] networks remain resilient."9

As discussed more fully below, the trial should be conducted at a regional level, covering a number of states (such as, for example, the Pacific Northwest or the Southeast), which would ensure a robust set of different urban and rural areas that may be served by different incumbents (or their affiliates). Carriers should interconnect efficiently at a single location in the region, such as a recognized Internet exchange point ("IXP"), where Internet service access providers already exchange non-voice IP traffic. All carriers operating in the chosen region that already provide IP-based voice services, whether directly or indirectly via an affiliate, should participate (and other carriers should be encouraged to participate so long as they agree to send and receive voice traffic using the IP protocol). 10 Interconnection rates and terms should be reasonable and efficient, and reached through an open and transparent negotiation process, and participants must have recourse to a regulatory arbiter in the event of any impasse. The FCC or state commissions also may be helpful in facilitating agreement on technical parameters for the trial by convening or facilitating multilateral discussions among participants.

Such a trial could corroborate many elements of the IP interconnection framework that wireless carriers, cable operators, and CLECs already have established among themselves. However, the trial would be more efficient than existing ad hoc arrangements by establishing

⁹ Public Notice. 28 FCC Rcd at 6346.

¹⁰ This trial would provide for the exchange of all voice traffic in IP format, irrespective of whether the traffic originated in IP or TDM format. Thus, the trial would permit a carrier that originates some portion of its voice traffic in TDM to use the regional IP interconnection point to hand off its TDM-originated voice traffic in IP format, irrespective of any existing interconnection agreement obligations.

one common interconnection point for all carriers in the region. The trial also would include carriers that, to date, have declined to participate in open negotiations towards efficient rates and terms for IP interconnection, often because of ILEC financial incentives to retain existing TDM interconnections. Reporting on the negotiation and implementation of IP interconnection arrangements should also be required in order to provide useful information for a permanent IP interconnection framework that preserves competition without the continuation of unnecessary legacy regulation designed for a different era.

II. IP INTERCONNECTION IS CENTRAL TO THE IP TRANSITION FOR ALL CARRIERS AND CUSTOMERS

As T-Mobile previously has shown, realizing the benefits of the IP transition depends upon carriers' ability to interconnect with one another in IP format at efficient locations on commercially reasonable terms. ¹¹ The traditional PSTN framework built around ILEC legacy infrastructure is rooted in less-efficient TDM technology, the regulatory regime of the Bell System divestiture, and anachronistic policy compromises. The current network and policies reflected in the FCC's rules (and various state commission precedents) governing interconnection enables ILECs to require carriers like T-Mobile to transport traffic to tens of thousands of points of interconnection ("POIs") deployed over the past century that are deep in the ILEC network (*e.g.*, local wire centers). This thicket of chokepoints allows ILECs to impose unnecessary costs on other carriers who are thus -- and will continue to be -- impeded in deploying new, innovative, and cost-effective services. Consumers will suffer from these higher costs.

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¹¹ T-Mobile AT&T/NTCA Comments at 4-7.

To avoid these negative effects impacting the TDM-to-IP transition and because it will likely take some time to move all voice traffic to IP networks, the sooner all parties are assured of reasonable terms and conditions governing the exchange all voice traffic in IP format, the more promptly the transition can be implemented without adverse effects on consumers and businesses that depend on a reliable communications network.

III. THE IP VOICE INTERCONNECTION TRIAL SHOULD BE REGIONAL IN SCOPE

A primary advantage of IP networks, relative to legacy TDM networks, is their ability to route large volumes of traffic efficiently over large geographic areas. The use of packet switching allows multiple, indirect routes for call completion, which is not technically feasible when using TDM circuit-switched technology. Today, however, those multiple routes typically have to run through ILEC-dominated legacy POIs, at which they can continue to control competitive access to their networks (including legacy network connections to other carriers) and end users, providing clear opportunities to impose excessive and discriminatory transport, termination and transit costs, as well as trunking and facility charges, on competitors.

The PSTN's reliance on rate centers and Local Access and Transport Areas is driven by divestiture-era intercarrier compensation ("ICC") and other rate structures rather than by technological imperatives. The IP interconnection trial should harness IP networks' greater efficiency by confirming the technical feasibility of interconnecting to exchange voice traffic at a few regional POIs. In fact, many wireless carriers, cable operators, and CLECs already are exchanging IP voice traffic at regional POIs, but the agreements governing those exchanges, arrived at through a multitude of bilateral negotiations between pairs of carriers, do not generally specify a single, common traffic exchange point in a region. Thus, potential IP network design

efficiencies are being diluted by the bilateral nature of most such IP traffic exchange arrangements.

Any region selected for a trial should have an obvious common traffic exchange point, such as an IXP. For example, the trial could cover the Pacific Northwest region using a POI in the greater Seattle area, or the Southeast region with a POI in the greater Atlanta area. Because most IP data traffic is already exchanged at IXPs, either directly or indirectly, carriers already bear the cost of transport to those points. Adding voice traffic to such transport facilities and POI exchanges would pose an insignificant incremental burden, given the relative volumes of Internet and voice traffic. In addition, having a common, competitively neutral POI for exchanging managed IP voice traffic would greatly facilitate efficient transit arrangements among carriers (thereby eliminating yet another current ILEC bottleneck).

All carriers in the region that already provide IP voice services (whether directly or indirectly via a corporate affiliate) should be required to participate – or the trial may be indistinguishable from the current environment. As noted above, the trial should include the exchange of all voice traffic in IP format, irrespective of the format in which the traffic originates or terminates. Carriers willing to establish regional IP interconnection points already have done so, or rapidly are moving to do so. Thus, one major utility of a trial is to test the effectiveness of a regional traffic exchange framework that includes *all* carriers – particularly the large ILECs – to exchange all voice traffic (regardless whether the voice traffic originated in TDM or IP format). Because different carriers have a different mix of TDM and IP retail

¹² In addition, the local number portability database is administered based on seven U.S. regions, and the database is capable of handling IP addressing.

¹³ Of course, other carriers should be permitted (indeed, encouraged) to participate in the trial – so long as they agree to exchange all voice traffic in the IP format.

customers, during the trial the terminating carrier should assume the responsibility (and cost) of any IP-to-TDM conversions needed to complete the call. ¹⁴ Such an approach is not only competitively neutral, but it also encourages all carriers to accelerate their sale of IP voice services so as to reduce these protocol conversion costs.

As discussed above, and as the TAC has acknowledged, the large ILECs have financial and regulatory incentives to exchange traffic in TDM format at legacy locations of their existing switching facilities. They are therefore unlikely to participate in a regional IP traffic exchange trial absent a requirement to do so. Again, mandating large ILEC participation in any regional IP interconnection trial accordingly is crucial to the success of the trial and to its usefulness in guiding IP transition policies.

IV. CARRIERS IN THE TRIAL SHOULD EXCHANGE TRAFFIC PURSUANT TO TRANSPARENTLY NEGOTIATED AGREEMENTS WITH A REGULATORY BACKSTOP

There would be no benefit to conducting a trial, as the Public Notice appears to propose, that would allow carriers to "negotiate in good faith without a backstop of regulations or specific parameters." The record developed in response to the AT&T and NTCA IP transition petitions demonstrates why carriers' negotiations towards IP interconnection agreements must occur with

¹⁴ Any carrier currently offering both TDM and IP-based voice services likely has the necessary equipment to convert voice traffic from TDM to IP and from IP to TDM since such carriers have to do so when exchanging traffic with ILECs that currently exchange all voice traffic in TDM format.

¹⁵ TAC Memo at 1 ("The Commission . . . suggests that existing inter-carrier compensation regimes did not advance technology neutral interconnection as LEC's [sic] have a 'more certain ability' to collect ICC under TDM.") (quoting *Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 18126 ¶ 1340 (2011) (subsequent history omitted) ("*USF/ICC Transformation Order*")).

¹⁶ Public Notice, 28 FCC Rcd at 6350.

a clearly defined regulatory backdrop.¹⁷ While wireless carriers, cable operators, and CLECs have moved aggressively to reach reasonable IP traffic exchange agreements with one another, other carriers consistently have refused to exchange voice traffic in IP format on reasonable terms.

Indeed, a "trial" with no backstop has already effectively been underway before and since the Commission directed parties to negotiate IP interconnection in good faith in the *USF/ICC Transformation Order* -- without providing additional regulatory backup. The absence of any apparent agreements involving Regional Bell Operating Companies and other large ILECs is compelling evidence that relying solely on good faith negotiations without a regulatory backstop is not an effective policy. ¹⁸

In T-Mobile's experience, to the extent that such carriers are willing to "negotiate" the exchange of voice traffic in IP format, they typically insist on a range of problematic items, including:

Yet, even this letter evidences Verizon's unwillingness to negotiate the kind of IP interconnection sought by competitive providers. Verizon's letter limits its offer to VoIP traffic, *i.e.*, voice traffic that originates as IP. As previously noted, an agreement limited to IP originated traffic would hamper the IP transition since competitive providers would be forced to continue using legacy TDM POIs to exchange TDM-originated voice traffic. For many carriers, that would be a significant volume of their voice traffic, and would require competitors to retain inefficient network infrastructure to accomplish the exchange of TDM voice traffic with Verizon.

¹⁷ See T-Mobile AT&T/NTCA Reply Comments at 5-7.

T-Mobile received a letter from Verizon's ILEC operations in June 2013, stating that a party could request negotiations with Verizon for the "exchange of VoIP traffic in IP format." It is the understanding of T-Mobile that other carriers received a similar, if not identical, letter. The timing of Verizon's offer to negotiate appears intended to attempt to undercut the competitive providers' position that ILECs have been unwilling to negotiate agreements for exchanging traffic in IP format.

- Insisting, as a precondition to negotiation, that other carriers execute strict nondisclosure agreements ("NDAs"), as a precondition to negotiation. These NDAs preclude carriers from disclosing to regulators or other carriers the terms of agreements. NDAs prevent other carriers from benefitting from one another's negotiations and regulators from monitoring the progress of IP interconnection.
- Requiring carriers to waive any claim that IP traffic is subject to the regulatory jurisdiction of the Commission or the states under Sections 251 or 252 of the Act. This condition places interconnecting carriers in a "Catch-22" situation, forcing them to choose between IP interconnection or reserving important statutory and regulatory protections ensuring that such an interconnection is fair.
- Requiring competitive carriers to pay to build deep within the ILEC's network, thus causing further delay and increasing T-Mobile's costs (and usually revenue for the ILEC) while defraying costs of the carrier that does not have to build to any facilities to a competitively neutral location.
- Insisting that other carriers exchange IP traffic with an affiliates rather than the ILEC itself, or insisting that an affiliate handle IP conversion. Such unregulated affiliates often impose unreasonable charges to exchange or convert traffic.
- Imposing charges on competitive carriers, ranging from intercarrier compensation to new types of charges (e.g., IP-to-TDM conversion charges, out-of-balance charges, etc.).

Accordingly, T-Mobile believes that the Commission should make clear that "good faith" negotiation must not contain any of the foregoing conditions. Indeed, T-Mobile submits that these clarifications to the good-faith negotiation requirement would be helpful irrespective of whether the Commission conducts an IP voice interconnection trial – and it urges the Commission to issue guidance to this effect.

An example of a common breakdown in good faith negotiations can be seen in AT&T's assertion in a pending state commission proceeding that its ILEC affiliate is unable and has no duty to interconnect with other carriers for the exchange of IP traffic because it is a TDM carrier, even though the ILEC delivers voice traffic to its own IP affiliate in IP format. ¹⁹ Similarly,

¹⁹ T-Mobile AT&T/NTCA Reply Comments at 6.

CenturyLink has argued "that IP interconnection regulation is unnecessary because providers always have the option to 'convert their traffic to TDM and use existing interconnection arrangements." 20

Given this real-world experience, it is important for the Commission to implement the Task Force's alternative proposal for a trial under "the existing section 251/252 framework or a similar process." T-Mobile previously has demonstrated that the Commission has authority to oversee IP interconnection under Sections 251, 252, and other provisions of the Act. As the Commission pointed out in the *USF/ICC Transformation Order*, with respect to Section 251, "its interconnection requirements are technology neutral – they do not vary based on whether one or both of the interconnecting providers is using TDM, IP or another technology in their underlying networks." Moreover, "carriers that offer basic interstate telecommunications functionality to" information service providers are still telecommunications carriers "covered by the relevant provisions of section 251... of the Act." Furthermore, because TDM voice traffic, which is undeniably a telecommunications service, will continue to be transmitted at least until the

²⁰ *Id*.

²¹ Public Notice, 28 FCC Rcd at 6350.

²² T-Mobile AT&T/NTCA Comments at 15-17; T-Mobile AT&T/NTCA Reply Comments at 8-10.

 $^{^{23}}$ USF/ICC Transformation Order, 26 FCC Rcd at 18126 \P 1342.

²⁴ Deployment of Wireline Services Offering Advanced Telecommunications Capability, 15 FCC Rcd 385, 402-03 \P 37 (1999), remanded on other grounds, WorldCom, Inc. v. FCC, 246 F.3d 690 (D.C. Cir. 2001).

transition is complete, the Commission will have ancillary jurisdiction over replacement IP services and the structure of the network over which that traffic is transmitted and exchanged.²⁵

The Public Notice appropriately asks who – state commissions, the Commission, or independent arbitrators – should resolve disputes over the terms of IP interconnection agreements. ²⁶ Independent arbitration (such as arbitration under the auspices of the American Arbitration Association) can be efficient, and parties always should retain the flexibility to use this arrangement if they mutually agree. Carriers must have recourse, however, to a regulatory arbiter with authority to expeditiously resolve any impasses that may arise. Even AT&T has conceded that "the *transition* to an all-IP world likely will require the Commission's active involvement on a range of issues."

There is no need to develop a new or novel process for this; existing state or federal processes can form the necessary basis for the resolution of disputes. That is, either the existing state arbitration process under Section 252 or a standard Commission process (such as the complaint process) could be used. Because efficient interconnection arrangements will be regional in nature (as opposed to state-specific), the exact scope of the respective state and federal roles would remain to be determined, but there is no doubt that a regulatory backstop will be required. The record and T-Mobile's experience suggest, however, that without an arbiter there is little hope for a successful trial.

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²⁵ See Comments of T-Mobile USA, Inc., at 6-7, WC Dkt. No. 10-90 (Feb. 24, 2012).

²⁶ See Public Notice at 6351.

²⁷ AT&T Comments at 9, WC Dkt. No. 10-90 (Feb. 24, 2012) (emphasis in original).

²⁸ CMRS carriers may use the Commission's Section 208 complaint process to enforce interconnection obligations. *Qwest Corp. v. FCC*, 252 F.3d 462, 464-66 (D.C. Cir. 2001).

V. THE IP INTERCONNECTION TRIAL SHOULD RUN FOR SIX MONTHS, AND THE COMMISSION SHOULD FACILITATE AGREEMENT ON TECHNICAL PARAMETERS

T-Mobile believes that the trial should last a minimum of six months. There should be four key steps in the timeline: (a) prompt designation of the regional POI and time for carriers to build or arrange for facilities to the regional POI and to develop and document technical parameters, culminating in a participation agreement with oversight by regulators (*e.g.*, two months); (b) time for carriers to conduct testing (*e.g.*, one month); (c) the running of a live test (*e.g.*, at least three months); and (d) carrier reporting on the results of the test.

Step 1: While the parties are individually connecting to the regional POI, the participants can work towards common agreement concerning key technical issues, including routing, addressing, security, signaling, media formats (codecs), non-voice media, quality of service, accounting/charging, and testing. While it may be possible for all of the carriers in a regional trial to negotiate to resolve these issues, such negotiation may not be effective or efficient – particularly since IP interconnection agreements will be negotiated bilaterally between pairs of carriers, and not collectively by all carriers participating in the trial. As a result, it may be better, for purposes of the trial, for the Commission to help ensure agreement on these parameters, such as by serving a convening or mediation function to ensure prompt agreement among participant carriers. Coordinated planning mediated by regulatory authorities would also strengthen carrier incentives to participate by expanding the benefits of IP interconnection for all carriers and consumers.

T-Mobile also submits that full-blown interconnection agreements probably are unnecessary simply for participation in the trial, and negotiation of such full-blown agreements

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²⁹ Public Notice, 28 FCC Rcd at 6350.

would likely delay the commencement of the trial. Instead, the trial can be conducted pursuant to a simple trial agreement setting forth the trial parameters that parties would sign as they enter the trial. The Commission should oversee the creation of such a trial agreement developed by the carriers during this first step, which will minimally contain technical parameters for the trial. The parameters should include that the trial:

- Utilizes IPv6, which is available today at scale (whereas IPv4 is scarce and may be more costly at this stage to acquire).
- Utilizes a standard codec such as Adaptive Multi-Rate Wideband ("AMR-WB"), which enables next generation HD voice quality. T-Mobile and other wireless carriers are deploying HD voice capabilities, and consumers eventually will insist on HD quality uniformly.

In addition, and consistent with the discussion above regarding good-faith negotiation requirements, the trial agreement should also contain provisions clarifying that:

- The trial agreement will be public;
- Voice traffic exchanged in IP format in the trial is subject to Section 251;
- Each participating carrier must accept traffic for itself and all of its affiliates in the regional trial;
- Voice traffic exchanged in IP format will be exchanged on a settlement-free basis, consistent with the Commission's decision to move towards a bill-and-keep arrangement for the exchange of traffic; and
- The cost of any needed TDM-to-IP conversion before the exchange and IP-to-TDM conversion after the exchange, absent agreement otherwise, will be the responsibility of each carrier.

T-Mobile fears that without these preliminary parameters, the "negotiation" of any agreement, trial, interconnection or otherwise, will cause delays that necessitate the regulators to get involved to resolve disputes over and over again.

Step 2: The participants should spend a reasonable (but brief) time testing connections, using baseline technologies for a successful trial.

Step 3: Carriers should exchange traffic in IP under the trial agreement and technical parameters over at least a three-month period in order to ensure that those arrangements and parameters have been thoroughly tested in practice.

Step 4: Trial participants should report on the progress and outcomes of the trial. T-Mobile agrees with the Public Notice's proposal that trial participants should "submit data regarding the length of time it took to reach an agreement, the issues in dispute, a copy of any agreements that are reached, as well as reports on the implementation of such agreements, such as call quality and reliability metrics, and a description of any technical problems that were encountered."³⁰ This type of reporting is the only way that the trial will generate useful data to determine how long-term permanent IP interconnection should be structured.

Given the need for a trial lasting at least six months, carriers should be required to submit reports on interconnection negotiations and technical coordination after three months and on all implementation issues at the end of the trial. More frequent reporting at the level of detail contemplated by the Public Notice would likely be more burdensome than is justified by the additional guidance that might be provided.

³⁰ *Id.* at 6351.

VI. CONCLUSION

The Commission should structure the IP interconnection trial(s) in the manner proposed in these comments. It is crucial that the large ILECs be required to participate in such trials in order to have any chance of success and to provide the type of information that would be most helpful in developing effective IP transition policies.

Respectfully submitted,

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